or an acid addition salt thereof, wherein the radicals R, R_1, R_2, R_3, R_4 and Z have the following meanings:

R represents

(1) hydrogen, or

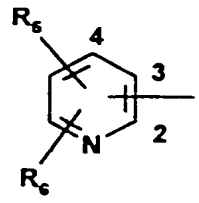
(2) (C_1-C_4)-alkyl, wherein the alkyl group is optionally mono- or polysubstituted by a phenyl ring,

which ring is optionally mono- or polysubstituted by halogen, (C_1-C_6)-alkyl, (C_3-C_7)-cycloalkyl, carbonyl groups, carboxyl groups esterified with (C_1-C_6)-alkanols, trifluoromethyl groups, hydroxyl groups, methoxy groups, ethoxy groups, benzyloxy groups and benzyl groups which are optionally mono- or polysubstituted on the phenyl moiety by (C_1-C_6)alkyl groups, halogen atoms or trifluoromethyl groups;

R_1 represents

(1) a phenyl ring which is mono- or polysubstituted by (C_1-C_6)-alkyl, (C_1-C_6)-alkoxy, hydroxyl, benzyloxy, nitro, amino, (C_1-C_6)-alkylamino, (C_1-C_6)-alkoxy-carbonylamino and by a carboxyl group or a carboxyl group esterified by a (C_1-C_6)-alkanol;

(2) a pyridine structure of formula II:



(II)

wherein the pyridine structure is alternatively bonded to the ring carbon atoms 2, 3 and 4 and is optionally substituted by R_5 and R_6, which may be identical or different and represent (C_1-C_6)-alkyl, (C_3-C_7) cycloalkyl, (C_1-C_6)alkoxy, nitro, amino, hydroxyl, halogen, trifluromethyl, an ethoxycarbonylamino radical and a carboxyalkyloxy group in which the alkyl group has 1-4 carbon atoms;

(3) a 2- or 4-pyrimidinyl-heterocycle or a pyridylmethyl radical in which CH_2 is in the 2-, 3- or 4- position, wherein the 2- pyrimidinyl ring is optionally mono- or polysubstituted by a methyl group;

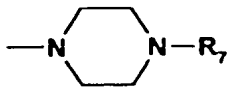
(4) a 2-, 3- or 4-quinolyl structure substituted by (C_1-C_6)-alkyl, halogen, a nitro group, an amino group or a (C_1-C_6)-alkylamino radical;

(5) a 2-, 3- or 4-quinolyl methyl group, wherein the ring carbons of the pyridylmethyl and quinolylmethyl radicals are optionally substituted by (C_1-C_6)-alkyl, (C_1-C_6)-alkoxy, nitro, amino and (C_1-C_6)-alkoxy-carbonylamino;

(6) if R represents hydrogen or a benzyl group, R_1 can represent the acid radical of a natural amino acid, wherein the amino group of said amino acid is present in protected or unprotected form wherein if R_1 represents an asparagyl or a glutamyl radical having a second nonbonded carboxyl group, said nonbonded carboxyl group is present as a free carboxyl group or in the form of an ester with C_1-C_6-alkanols;

(7) an allylaminocarbonyl-2-methylprop-1-yl group; or

R_1 and R, together with the nitrogen atom to which they are bonded, form a piperizine ring of formula III:



(III)

or a homopiperazine ring if R_1 represents an aminoalkylene group, in which R_7 represents an alkyl radical, a phenyl ring which is optionally mono- or polysubstituted by $(C_1\text{-}C_6)$-alkyl, $(C_1\text{-}C_6)$-alkoxy, halogen, a nitro group, an amino function, $(C_1\text{-}C_6)$-alkylamino, benzhydryl group and bis-p-fluorobenzylhydryl group;

R_2 represents

(1) hydrogen;

(2) a $(C_1\text{-}C_6)$-alkyl group,

said alkyl group being optionally mono- or polysubstituted by halogen

or a phenyl ring,

which ring is optionally mono- or polysubstituted by halogen, $(C_1\text{-}C_6)$-alkyl, $(C_3\text{-}C_7)$-cycloalkyl, carbonyl groups, carboxyl groups esterified with $(C_1\text{-}C_6)$-alkanols, trifluoromethyl groups, hydroxyl groups, methoxy groups, ethoxy groups, or benzyloxy groups;

or by a 2-quinolyl group or a 2-,3- or 4-pyridyl structure

which are optionally mono- or polysubstituted by halogen, $(C_1\text{-}C_4)$-alkyl groups or $(C_1\text{-}C_4)$-alkoxy groups;

(3) an aroyl radical, wherein the aroyl moiety on which the radical is based is a phenyl ring which is optionally mono- or polysubstituted by halogen, $(C_1\text{-}C_6)$-alkyl, $(C_3\text{-}C_7)$-cycloalkyl, carbonyl groups, carboxyl groups esterified with $(C_1$-

C_6)-alkanols, trifluoromethyl groups, hydroxyl groups, methoxy groups, ethoxy groups, or benzyloxy groups;

R_3 and R_4, which are identical or different, represent hydrogen, hydroxyl, (C_1-C_6)-alkyl, (C_3-C_7)-cycloalkyl, (C_1-C_6)-alkanoyl, (C_1-C_6)-alkoxy, halogen, benzoxy, a nitro group, an amino group, a (C_1-C_4)-mono- or dialkyl substituted amino group, a (C_1-C_3)-alkoxycarbonylamino function or a (C_1-C_3)-alkoxycarbonylamino-(C_1-C_3)-alkyl function; and

Z represents O or S;

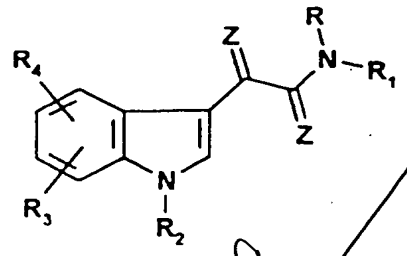
wherein alkyl, alkanol, alkoxy and alkylamino groups may be straight chained or branched.

10. The N-substituted indol-3-glyoxylamide of claim 9 wherein R is hydrogen or a benzyl group and R_1 is the acid radical of an amino acid selected from the group consisting of α-glycyl, α-alanyl, α-leucyl, α-isoleucyl, α-seryl, α-phenylalanyl, α-histidyl, α-prolyl, α-arginyl, α-lysyl, α-asparagyl and α-glutamyl.

11. The N-substituted indol-3-glyoxylamide of claim 10 wherein R represents hydrogen or a benzyl group and R_1 represents α-asparagyl or α-glutamyl, in which the nonbonded carboxyl group is a methyl, ethyl or tert-butyl ester.

12. The N-substituted indol-3-glyoxylamide of claim 10 wherein R represents hydrogen or a benzyl group and R_1 represents the acid radical of a natural amino acid protected by a carbobenzoxy radical, a tert-butoxycarbonyl radical or an acetyl group.

13. A method of treating asthma and/or allergy in a mammal comprising the step of administering to said mammal a treatment-effective amount of a compound of formula I:



(I)

or an acid addition salt thereof, wherein the radicals R, R_1, R_2, R_3, R_4 and Z have the following meanings:

R represents

(1) hydrogen, or

(2) (C_1-C_4)-alkyl, wherein the alkyl group is optionally mono- or polysubstituted by a phenyl ring,

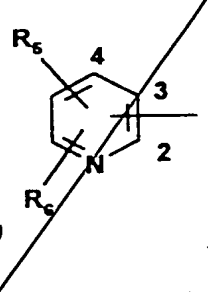
which ring is optionally mono- or polysubstituted by halogen, (C_1-C_6)-alkyl, (C_3-C_7)-cycloalkyl, carbonyl groups, carboxyl groups esterified with (C_1-C_6)-alkanols, trifluoromethyl groups, hydroxyl groups, methoxy groups, ethoxy groups, benzyloxy groups and benzyl groups which are optionally

mono- or polysubstituted on the phenyl moiety by (C_1-C_6)alkyl groups, halogen atoms or trifluoromethyl groups;

R_1 represents

(1) a phenyl ring which is mono- or polysubstituted by (C_1-C_6)-alkyl, (C_1-C_6)-alkoxy, hydroxyl, benzyloxy, nitro, amino, (C_1-C_6)-alkylamino, (C_1-C_6)-alkoxy-carbonylamino and by a carboxyl group or a carboxyl group esterified by a (C_1-C_6)-alkanol;

(2) a pyridine structure of formula II:



(II)

wherein the pyridine structure is alternatively bonded to the ring carbon atoms 2, 3 and 4 and is optionally substituted by R_5 and R_6, which may be identical or different and represent (C_1-C_6)-alkyl, (C_3-C_7) cycloalkyl, (C_1-C_6)alkoxy, nitro, amino, hydroxyl, halogen, trifluromethyl, an ethoxycarbonylamino radical and a carboxyalkyloxy group in which the alkyl group has 1-4 carbon atoms;

(3) a 2- or 4-pyrimidinyl-heterocycle or a pyridylmethyl radical in which CH_2 is in the 2-, 3- or 4- position, wherein the 2- pyrimidinyl ring is optionally mono- or polysubstituted by a methyl group;

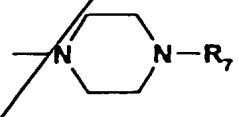
(4) a 2-, 3- or 4-quinolyl structure substituted by (C_1-C_6)-alkyl, halogen, a nitro group, an amino group or a (C_1-C_6)-alkylamino radical;

(5) a 2-, 3- or 4-quinolyl methyl group, wherein the ring carbons of the pyridylmethyl and quinolylmethyl radicals are optionally substituted by $(C_1$-$C_6)$-alkyl, $(C_1$-$C_6)$-alkoxy, nitro, amino and $(C_1$-$C_6)$-alkoxy-carbonylamino;

(6) if R represents hydrogen or a benzyl group, R_1 can represent the acid radical of a natural amino acid, wherein the amino group of said amino acid is present in protected or unprotected form wherein if R_1 represents an asparagyl or a glutamyl radical having a second nonbonded carboxyl group, said nonbonded carboxyl group is present as a free carboxyl group or in the form of an ester with C_1-C_6-alkanols;

(7) an allylaminocarbonyl-2-methylprop-1-yl group; or

R_1 and R, together with the nitrogen atom to which they are bonded, form a piperizine ring of formula III:



(III)

or a homopiperazine ring if R_1 represents an aminoalkylene group, in which R_7 represents an alkyl radical, a phenyl ring which is optionally mono- or polysubstituted by $(C_1$-$C_6)$-alkyl, $(C_1$-$C_6)$-alkoxy, halogen, a nitro group, an amino function, $(C_1$-$C_6)$-alkylamino, benzhydryl group and bis-p-fluorobenzylhydryl group;

R_2 represents

(1) hydrogen;

(2) a (C_1-C_6)-alkyl group,

said alkyl group being optionally mono- or polysubstituted by halogen or a phenyl ring,

which ring is optionally mono- or polysubstituted by halogen, (C_1-C_6)-alkyl, (C_3-C_7)-cycloalkyl, carbonyl groups, carboxyl groups esterified with (C_1-C_6)-alkanols, trifluoromethyl groups, hydroxyl groups, methoxy groups, ethoxy groups, or benzyloxy groups;

or by a 2-quinolyl group or a 2-,3- or 4-pyridyl structure

which are optionally mono- or polysubstituted by halogen, (C_1-C_4)-alkyl groups or (C_1-C_4)-alkoxy groups;

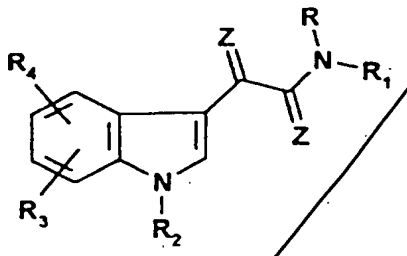
(3) an aroyl radical, wherein the aroyl moiety on which the radical is based is a phenyl ring which is optionally mono- or polysubstituted by halogen, (C_1-C_6)-alkyl, (C_3-C_7)-cycloalkyl, carbonyl groups, carboxyl groups esterified with (C_1-C_6)-alkanols, trifluoromethyl groups, hydroxyl groups, methoxy groups, ethoxy groups, or benzyloxy groups;

R_3 and R_4, which are identical or different, represent hydrogen, hydroxyl, (C_1-C_6)-alkyl, (C_3-C_7)-cycloalkyl, (C_1-C_6)-alkanoyl, (C_1-C_6)-alkoxy, halogen, benzoxy, a nitro group, an amino group, a (C_1-C_4)-mono- or dialkyl substituted amino group, a (C_1-C_3)-alkoxycarbonylamino function or a (C_1-C_3)-alkoxycarbonylamino-(C_1-C_3)-alkyl function; and

Z represents O or S;

wherein alkyl, alkanol, alkoxy and alkylamino groups may be straight chained or branched.

14. A method of inducing regression of an immunological reaction in a mammal comprising the step of administering to said mammal an effective amount of a compound according to formula I:



(I)

or an acid addition salt thereof, wherein the radicals R, R_1, R_2, R_3, R_4 and Z have the following meanings:

R represents

(1) hydrogen, or

(2) (C_1-C_4)-alkyl, wherein the alkyl group is optionally mono- or polysubstituted by a phenyl ring,

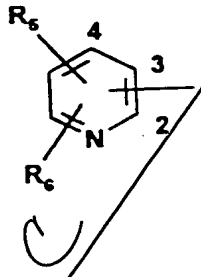
which ring is optionally mono- or polysubstituted by halogen, (C_1-C_6)-alkyl, (C_3-C_7)-cycloalkyl, carbonyl groups, carboxyl groups esterified with (C_1-C_6)-alkanols, trifluoromethyl groups, hydroxyl groups, methoxy groups, ethoxy groups, benzyloxy groups and benzyl groups which are optionally

mono- or polysubstituted on the phenyl moiety by (C_1-C_6)alkyl groups, halogen atoms or trifluoromethyl groups;

R_1 represents

(1) a phenyl ring which is mono- or polysubstituted by (C_1-C_6)-alkyl, (C_1-C_6)-alkoxy, hydroxyl, benzyloxy, nitro, amino, (C_1-C_6)-alkylamino, (C_1-C_6)-alkoxy-carbonylamino and by a carboxyl group or a carboxyl group esterified by a (C_1-C_6)-alkanol;

(2) a pyridine structure of formula II:



(II)

wherein the pyridine structure is alternatively bonded to the ring carbon atoms 2, 3 and 4 and is optionally substituted by R_5 and R_6, which may be identical or different and represent (C_1-C_6)-alkyl, (C_3-C_7) cycloalkyl, (C_1-C_6)alkoxy, nitro, amino, hydroxyl, halogen, trifluromethyl, an ethoxycarbonylamino radical and a carboxyalkyloxy group in which the alkyl group has 1-4 carbon atoms;

(3) a 2- or 4-pyrimidinyl-heterocycle or a pyridylmethyl radical in which CH_2 is in the 2-, 3- or 4- position, wherein the 2- pyrimidinyl ring is optionally mono- or polysubstituted by a methyl group;

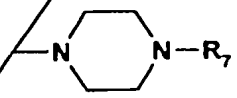
(4) a 2-, 3- or 4-quinolyl structure substituted by (C_1-C_6)-alkyl, halogen, a nitro group, an amino group or a (C_1-C_6)-alkylamino radical;

(5) a 2-, 3- or 4-quinolyl methyl group, wherein the ring carbons of the pyridylmethyl and quinolylmethyl radicals are optionally substituted by (C_1-C_6)-alkyl, (C_1-C_6)-alkoxy, nitro, amino and (C_1-C_6)-alkoxy-carbonylamino;

(6) if R represents hydrogen or a benzyl group, R_1 can represent the acid radical of a natural amino acid, wherein the amino group of said amino acid is present in protected or unprotected form wherein if R_1 represents an asparagyl or a glutamyl radical having a second nonbonded carboxyl group, said nonbonded carboxyl group is present as a free carboxyl group or in the form of an ester with C_1-C_6-alkanols;

(7) an allylaminocarbonyl-2-methylprop-1-yl group; or

R_1 and R, together with the nitrogen atom to which they are bonded, form a piperizine ring of formula III:



(III)

or a homopiperazine ring if R_1 represents an aminoalkylene group, in which R_7 represents an alkyl radical, a phenyl ring which is optionally mono- or polysubstituted by (C_1-C_6)-alkyl, (C_1-C_6)-alkoxy, halogen, a nitro group, an amino function, (C_1-C_6)-alkylamino, benzhydryl group and bis-p-fluorobenzylhydryl group;

R_2 represents

(1) hydrogen;

(2) a (C_1-C_6)-alkyl group,

said alkyl group being optionally mono- or polysubstituted by halogen or a phenyl ring,

which ring is optionally mono- or polysubstituted by halogen, (C_1-C_6)-alkyl, (C_3-C_7)-cycloalkyl, carbonyl groups, carboxyl groups esterified with (C_1-C_6)-alkanols, trifluoromethyl groups, hydroxyl groups, methoxy groups, ethoxy groups, or benzyloxy groups;

or by a 2-quinolyl group or a 2-,3- or 4-pyridyl structure

which are optionally mono- or polysubstituted by halogen, (C_1-C_4)-alkyl groups or (C_1-C_4)-alkoxy groups;

(3) an aroyl radical, wherein the aroyl moiety on which the radical is based is a phenyl ring which is optionally mono- or polysubstituted by halogen, (C_1-C_6)-alkyl, (C_3-C_7)-cycloalkyl, carbonyl groups, carboxyl groups esterified with (C_1-C_6)-alkanols, trifluoromethyl groups, hydroxyl groups, methoxy groups, ethoxy groups, or benzyloxy groups;

R_3 and R_4, which are identical or different, represent hydrogen, hydroxyl, (C_1-C_6)-alkyl, (C_3-C_7)-cycloalkyl, (C_1-C_6)-alkanoyl, (C_1-C_6)-alkoxy, halogen, benzoxy, a nitro group, an amino group, a (C_1-C_4)-mono- or dialkyl substituted amino group, a (C_1-C_3)-alkoxycarbonylamino function or a (C_1-C_3)-alkoxycarbonylamino-(C_1-C_3)-alkyl function; and

Z represents O or S;